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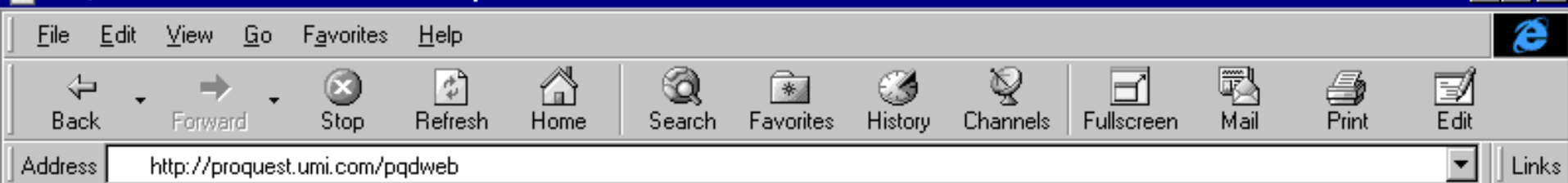
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2. [The Latest Arms-Control Pipe Dream](#); Wall Street Journal By Frank J. Gaffney Jr.; Jan 11, 1999
3. [The digital reference](#); Armor Karl Gunzelman; Jan/Feb 1999
4. [New ACM press books](#); Association for Computing Machinery. Communications of the ACM Anonymous; Dec 1998
5. [Tactical deception in information warfare: A new paradigm for C4I](#); Journal of Electronic Defense Ronald K Newland; Dec 1998
6. [The US transition to information warfare](#); Journal of Electronic Defense Edward Waltz; Dec 1998
7. [The intelligence, surveillance, reconnaissance and target acquisition requirement--an overview](#); RUSI Journal Tony Mason; Dec 1998
8. [Building information security layer by layer](#); United States Naval Institute. Proceedings J M McConnell; Dec 1998
9. [Microsoft: A U.S. security threat](#); Computerworld Paul A Strassman; Nov 30, 1998
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☐ 8.    [Building information security layer by layer](#); **United States Naval Institute. Proceedings** J M McConnell; Dec 1998

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## Building information security layer by layer

United States Naval Institute. Proceedings; Annapolis; Dec 1998; [J M McConnell](#); [Edward J Giorgio](#);

Volume: 124

Issue: 12

Start Page: 44-47

ISSN: 0041798X

Subject Terms: [Armed forces](#)  
[Risk management](#)  
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...management approach, the US Navy will rely on defense in depth to thwart  
**formation warfare** attackers.

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[Headnote]

Using a risk-management approach, the Navy will rely on defense in depth to thwart potential information warfare  
attackers.

Recent naval initiatives-Information Technology for the 21st Century (IT-21), network-centric warfare, and  
the Navy virtual intranet (NVI)-provide a framework for the information-management infrastructure over  
which naval operations will be conducted. The foundation on which they are built, information superiority,

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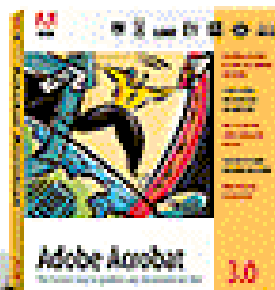
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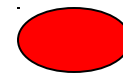
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fied solutions that allow classified information to cross between networks are not commonly available, so we are tempted to select the "best commercial practice" for keeping them logically separate. For example, within any given enterprise, it is unwise to allow all the external connections to be made from a single host, thus putting the base on risk on its completion of a single operation. We most often assume that the information is physically separate from other networks and we accept that risk accepted by one means risk assumed by all.

# Image format

The diagram illustrates the Navy Virtual Intranet architecture, showing a hierarchical structure of components and their interconnections:

- INTERNET**: The top-level external network.
- NAVY VIRTUAL INTRANET**: A dashed-line boundary enclosing the internal components.
- FIREWALL**: A rectangular box representing the first security layer.
- INTER-ORANGE**: An oval representing a network segment or protocol.
- INFORMATION DEPOSITION**: A rectangular box representing a data storage or processing component.
- INTER-ORANGE**: Another oval representing a network segment or protocol.
- SHIP**: A dashed-line boundary enclosing the components located on the ship.
- INFORMATION FILTER**: A rectangular box representing a data filtering component.
- INTER-ORANGE**: A final oval representing a network segment or protocol.
- WORKSTATION**: A dark rectangular area at the bottom containing an image of a person at a computer, representing the end-user environment.

The flow of data or communication is indicated by vertical lines connecting the components in sequence: Internet to Firewall, Firewall to Inter-Orange, Inter-Orange to Information Deposition, Information Deposition to Inter-Orange, Inter-Orange to Information Filter, and Information Filter to Inter-Orange, which finally connects to the Workstation.

ment and therefore made the introduction of new technology nearly impossible. Such thinking historically has led to gold-plated security systems that frequently are late to the marketplace. Defense in depth, on the other hand, is a risk management approach to security that accepts the chance that an attacker may get through one or two layers of defense, but the probability of the attacker getting through all layers is acceptably low. Driving this probability down can be accomplished only if each layer performs both intrusion detection and firewall functions. Potential intruders must be blocked or detected, and the appropriate action must be taken to deter the attack.

The Navy Chief Information Officer has the responsibility and authority to develop the policy, standards, guidance, and strategy needed to create and sustain a living information infrastructure. The operational model includes

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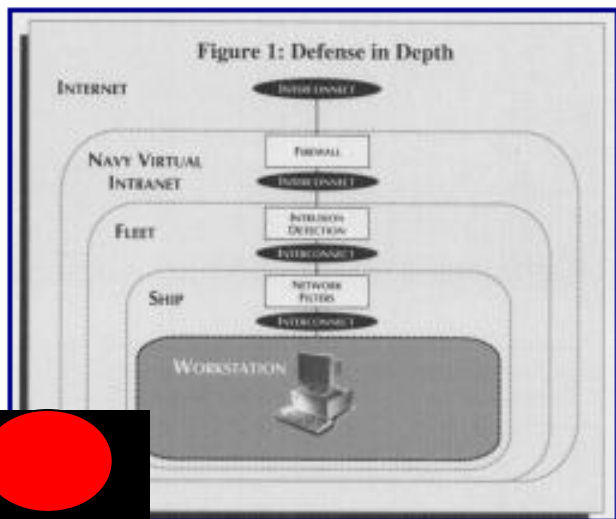


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in depth and risk management are two pillars of current Navy policy, but measuring risk needs to be a reasoned approach that incorporates the identity of the adversary, intent, capabilities, and Navy ties. The global village model of where the Internet is taking us leaves little doubt that our fleet will have the prerequisite exposure to develop the needed skills and experience. So we are left in the end, trying to estimate the amount of risk we actually are taking. This, coupled with the diversity of threats, only compounds the problem.